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ONTARIO MINISTRY OF AGRICULTURE AND FOOD
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REPORT NO. 86-04

VEGETABLE CROPS

ESTIMATED PRODUCTION COSTS

ONTARIO, 1986

Economics and Policy Coordination Branch
Ontario Ministry of Agriculture and Food
Legislative Buildings, Queen's Park
Toronto, Ontario, M7A 1B6

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INTRODUCTION

Since 1948, the Economics and Policy Coordination Branch has carried out comprehensive studies of major field and horticultural crops grown in Ontario. These studies were designed to determine costs and returns of various farm enterprises, as well as the physical amounts of production inputs required.

Traditionally, data was collected by means of farmer interviews. Published reports of these studies in the form of county, regional and provincial averages found a wide distribution among extension and research personnel, educational institutions, farm organizations, lending institutions and policy makers. Cooperating farmers received reports showing their individual information in comparison with group averages.

With this extensive background in the development of cost studies, the Economics and Policy Coordination Branch has begun to use computers in the preparation of cost data. Methods of computer simulation have now replaced the time consuming process of data collection, tabulation and analysis.

With this new approach, special attention is paid to the physical quantities and prices of inputs for each crop studied. The technology used in the production of various crops is carefully examined so that the computer models accurately reflect the appropriate production technology for each commodity.

Information on physical inputs is obtained from a number of sources, including:

1. Previous studies done by this Branch;
2. Surveys of the farm supply trade;
3. Technical input/output coefficients; and
4. The consensus of producers, researchers, and extension and agribusiness personnel.

THE DEVELOPMENT OF THE ACRES PROGRAM

A large number of computer programs that generate budgets and crop production cost estimates are now in existence. These computer programs vary in their degree of sophistication and in the amount of detail prepared. A large number of estimates covering a wide range of conditions can be generated quickly and efficiently. The effect of varying levels of technology, management practices and price levels can also be analyzed.

Cost of production estimates used in this report are based on the ACRES program. ACRES (Agricultural Crop Enterprises System) is a FORTRAN program originally written in Montana, adapted by Alberta Agriculture and recently modified and rewritten by the Economics and Policy Coordination Branch to meet Ontario conditions. All 1986 cost of production estimates in this report are based on this computer model.

METHODS AND PROCEDURES

The information used in the preparation of each production cost estimate in this report was prepared through the use of recent Economics and Policy Coordination Branch studies, plus consultations with producers and extension, research and agribusiness personnel.

For each crop cost estimate in this report, the data was organized into variable and fixed costs and totalled to arrive at the cost of production both on a per acre and per hectare basis. Variable costs are those which vary directly with the production of each crop grown. They include seed, plants, hired labor, fertilizer, herbicides, insecticides, fungicides, other materials, machinery operating costs, marketing charges and interest on operating capital. Fixed cost inputs are operator labor, management allowance, interest on land, machinery and buildings, depreciation on machinery and buildings, taxes on real estate (net of farm tax rebate), and other overhead cost items.

In this report, cash costs of production are also determined. Cash costs include total variable costs, interest on the debt portion of investment in tractors and machines, taxes and other overhead costs.

LABOR HOURS AND COSTS

The required number of labor hours was based on previous studies, as well as through discussions with those familiar with the production of each study crop. There are some crops which are harvested on a fixed rate per unit. For these crops, the labor hours and costs vary with the yields used in the cost estimate.

The operator labor hours were valued at $6.75 per hour. In addition, an allowance to management was made at the rate of 5 percent of the gross income.

The hired labor cost was calculated on a per hour basis and included benefits such as worker compensation, unemployment insurance, and the Canada Pension Plan. The rates varied according to area, crop and skill involved.

For some crops, piece work rates were used which were suggested by local farm labor pools. An allowance of 15 percent of basic earnings was added to cover benefits.

MATERIALS

The amount of each material input was based on commonly used practices. Input prices are based on averages charged by the trade in the area where the particular crop is grown. For most crops, the quantities of seed, plants, fertilizer nutrients and other inputs are given on a per hectare basis. Because of the multitude of products available, pesticides are grouped as herbicides, insecticides, fungicides, nematicides, etc. The cost and quantity of non-returnable containers is reported where applicable.

TRACTORS, MACHINES AND TRUCKS

Machinery complements used in the various crop production cost estimates were assumed to be five years old. Tractor and machine costs included depreciation, interest on investment, insurance, storage, repairs, maintenance, fuel and lubrication. If machines were used for other farming operations, costs were adjusted based on the proportion of use on the study crop. The declining balance method of depreciation was used, and a 15 percent rate to powered and a 10 percent rate to non-powered machines was applied.

Interest on machinery investment was calculated on the assumption that the equity portion was 70 percent and the debt portion was 30 percent of the total depreciated value. For this report, interest on equity was calculated at 6.1 percent, which was the average interest rate paid by chartered banks on savings accounts. The interest on the debt portion was based on the average prime rate of 10.5 percent, plus one for a total of 11.5 percent. Insurance and storage costs for machinery were based on 1.5 percent of their purchase price.

Repair and maintenance costs for individual machines were based on the fact sheet, "Cost of Owning and Operating Farm Machines", Agdex 825, Ontario Ministry of Agriculture and Food.

Fuel costs were based on the size of each tractor, truck or self-propelled machine used in the production operation. The following farmgate fuel prices were used: gasoline - 36.0 cents/litre; diesel - 37.0 cents/litre. The cost of oil, grease and filters was calculated at 15 percent of the fuel cost.

CUSTOM FARMWORK SERVICES

There are crops produced in Ontario where it is an accepted practice to use custom farmwork services to perform certain operations. Usually, these services are employed when the farmer needs specialized machines, such as harvesters, sprayers, fertilizer applicators and trucks. Most of these machines cannot be economically owned and operated by one producer. Custom costs were itemized on a per hectare or per acre basis.

LAND CHARGES

Determining the annual cost for land use is a controversial part in any study on production costs. During the past two decades, purchasers of farmland have been willing to pay more for it than can be justified from agricultural production. Purchasers believe the speculative aspect of land ownership in inflationary times offers benefits above those received from crop production. In deflationary times, however, this situation is reversed. For this reason, the appropriate interest rate used in calculating the interest cost on bare land for these crop production estimates is the real interest rate. The "real interest rate" is defined as the current lending rate of interest adjusted for inflation.

In this report, interest on land investment was calculated as follows:

1. The value of bare land was based on the average value for land in areas of Ontario where the production of each study crop predominates.

2. The interest rate applied was the prime rate discounted for the rate of inflation, which resulted in a 6.6 percent rate.

The farm real estate taxes used for each study crop reflect the area of production and are subject to Ontario's Farm Tax Reduction Program.

BUILDING COSTS

For those crops where buildings are used in grading, packing, and/or storage, a building cost allowance was made.

The initial cost of these structures was based on the assumption that buildings were five years old.

Depreciation	%
Steel and concrete structures	2.5
Wood structures	5.0
Greenhouses	2.0

The interest on building investment was set at 6.4 percent, which was also used in calculating interest on land investment.

Repairs and Maintenance	%
Steel structures	1.0
Concrete structures	0.25
Wood structures	1.5

Insurance

0.5 percent of initial costs

The cost of machine housing was covered under tractor and machine costs.

Allowances are made for the use of picking baskets, storage bins, and other pieces of reusable equipment required in the production of certain crops.

INTEREST ON OPERATING CAPITAL

Interest on operating capital required to finance each crop was calculated from the time an expenditure was made until the time income was generated from sales. Operating capital includes the cost of materials, fuel, repairs, hired labor and other cash items. In this study, the interest rate applied to operating capital was the average prime rate of 10.5 percent plus 1 percent.

OTHER OVERHEAD

This allowance covers such items as the study crop's share of utilities, accounting and administration costs, use of the farm automobile, and general farm maintenance.

OTHER COST CONSIDERATIONS

Depending on the crop studied, there are certain additional costs such as crop insurance, marketing board fees, grading charges and selling commissions.

YIELDS AND RETURNS

For each study crop presented in this report, a footnote to the table defines how the average yield and average price were calculated.

Additional information on average yields and prices is shown in the Appendix of this report.

GROSS MARGIN ANALYSIS

Gross margin is the amount above the variable costs that a crop contributes to the operator for his wages, management, and to the investment in machinery and land.

CASH ANALYSIS

The cash analysis section estimates the returns over cash costs. Cash costs comprise of all variable costs, as well as interest on the debt portion of tractor and machine investment, real estate taxes and other overhead costs.

Table 1. - Asparagus "Preplant Year" Costs: Estimated Cost of Production, 1986

	Cost, $ per hectare	Cost, $ per acre
VARIABLE COSTS		
Fertilizer:		
10-20-30 400 kg/ha	99	40
Herbicides	97	39
Green manure seed	14	6
Tractor and machine costs:		
Repairs and maintenance	19	8
Fuel	28	11
Interest on operating capital	74	30
TOTAL	331	134
FIXED COSTS		
Operator labor, 7.4 hours/ha	50	20
Tractor and machine costs:		
Depreciation	50	20
Interest on investment	24	10
Insurance and storage	9	4
Interest on land, $4,450/ha @ 6.6% per annum	147	59
Taxes	20	8
TOTAL	300	121
TOTAL "PREPLANT YEAR" COSTS	631	255

Table 2. - Asparagus "Preplant Year" Costs: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	2.47	1.0	63.36	25.64
Discing	1	1.24	.5	27.45	11.11
Seeding green manure	1	1.24	.5	29.88	12.09
Spraying herbicide	1	1.24	.5	29.90	12.10
Fertilizing	1	1.24	.5	29.88	12.09

Table 3. - Asparagus "Planting Year" Costs: Estimated Cost of Production, 1986

	Cost, $ per hectare	Cost, $ per acre
VARIABLE COSTS		
Hired labor, 74.1 hours/ha	389	157
Fertilizer:		
Superphosphate 370 kg/ha	101	41
Am. Nit. 250 kg/ha	53	21
Lime, 34.6 t/ha	69	28
Insecticides	59	24
Herbicides	187	76
Roots, 27,182/ha	2,175	880
Custom and rentals	153	62
Tractor and machine costs:		
Repairs and maintenance	81	33
Fuel	110	44
Interest on operating capital	583	236
TOTAL	3,960	1,602
FIXED COSTS		
Operator labor, 24.7 hours/ha	167	67
Tractor and machine costs:		
Depreciation	171	69
Interest on investment	85	35
Insurance and storage	34	14
Interest on land, $4,450/ha @ 6.6% per annum	294	119
Taxes	39	16
Other overhead costs	247	100
TOTAL	1,037	420
TOTAL "PLANTING YEAR" COSTS	4,997	2,022

Table 4. - Asparagus "Planting Year" Costs: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	2.47	1.0	63.36	25.64
Discing	2	4.94	2.0	54.96	22.24
Trenching	1	2.47	1.0	91.08	36.86
Fertilizing	1	1.24	.5	27.43	11.10
Planting	1	47.0	19.0	396.54	160.47
Replanting	1	2.47	1.0	12.97	5.25
Covering trench	1	2.47	1.0	62.25	25.19
Cultivating	2	4.94	2.0	65.95	26.69
Spraying herbicide	2	4.94	2.0	59.85	24.22
Hand hoeing	1	29.7	12.0	155.68	63.00
Fertilizing	1	1.24	.5	27.43	11.10
Spraying insecticide	2	4.94	2.0	94.40	38.20

Table 5. - Asparagus "Growth Year" Costs: Estimated Cost of Production, 1986

	Cost, $ per hectare	Cost, $ per acre
VARIABLE COSTS		
Hired labor, 12.4 hours/ha	65	26
Fertilizer:		
15-15-15 370 kg/ha	85	35
Am. Nit. 220 kg/ha	48	19
Insecticides	89	36
Fungicides	48	19
Herbicides	207	84
Tractor and machine costs:		
Repairs and maintenance	47	19
Fuel	36	15
Interest on operating capital	36	15
TOTAL	661	268
FIXED COSTS		
Operator labor, 9.3 hours/ha	62	25
Tractor and machine costs:		
Depreciation	75	31
Interest on investment	40	16
Insurance and storage	16	6
Interest on land, $4,450/ha @ 6.6% per annum	294	119
Taxes	39	16
Other overhead costs	247	100
TOTAL	773	313
TOTAL "GROWTH YEAR" COSTS	1,434	581

Table 6. - Asparagus "Growth Year" Costs: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Stalk shredding	1	.62	.25	19.00	7.69
Fertilizing	2	2.47	1.0	54.93	22.23
Cultivating	1	1.24	.5	32.94	13.33
Spraying herbicide	1	1.24	.5	29.90	12.10
Spraying pesticides	3	3.71	1.5	141.57	57.29
Hand hoeing	1	12.36	5.0	64.87	26.25

Table 7. - Asparagus Preharvest and Harvest Costs for Processing Purposes: Estimated Cost of Production, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor:		
Preharvest, 12.4 hours/ha	65	26
Harvest, 220 hours/ha	1,158	469
Fertilizer:		
15-15-15, 370 kg/ha	85	35
Am. Nit. 220 kg/ha	48	19
Insecticides	89	36
Fungicides	48	19
Herbicides	207	84
Tractor and machine costs:		
Repairs and maintenance	114	46
Fuel	266	108
Building, repairs	15	6
Marketing board fees	87	35
Receiving station fees	111	45
Interest on operating capital	66	27
TOTAL	2,359	955
FIXED COSTS		
Operator labor:		
Preharvest, 9.3 hours/ha	62	25
Harvest, 98.8 hours/ha	667	270
Management allowance, 5% of gross income	198	80
Tractor and machine costs:		
Depreciation	297	120
Interest on investment	144	58
Insurance and storage	62	25
Interest on land, $4,450/ha @ 6.6% per annum	294	119
Taxes	39	16
Building use	186	75
Other overhead costs	247	100
TOTAL	2,196	888
TOTAL PREHARVEST AND HARVEST COSTS	4,555	1,843
GROSS MARGIN ANALYSIS		
(Based on assumed yields of 2,018 kg/ha or 1,800 lbs./acre and assumed price of $1.96/kg or $0.89/lb.)		
Gross income	3,959	1,602
Variable costs:		
Amortized establishment costs[a]	756	306
Preharvest and harvest	2,358	954
TOTAL	3,114	1,260
Gross margin	845	342
CASH ANALYSIS		
Gross income	3,959	1,602
Cash costs:		
Amortized establishment costs[a]	756	306
Preharvest and harvest[b]	2,728	1,104
TOTAL	3,484	1,410
Returns over cash costs	475	192

[a] Amortized establishment costs include preplant year costs, planting year costs, and growth year costs amortized over 15 years at a rate of 6.6 percent.

[b] Cash costs for preharvest and harvest include total variable costs plus interest on the debt portion of investment in tractors and machines of $64/ha ($26/ac.) plus taxes and other overhead costs.

Table 8. - Asparagus Preharvest and Harvest Costs for Processing Purposes: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Stalk shredding.....	1	.62	.25	19.00	7.69
Fertilizing.....	2	2.47	1.0	54.93	22.23
Cultivating.....	1	1.24	.5	32.94	13.33
Spraying herbicide.....	1	1.24	.5	29.90	12.10
Spraying pesticides.....	3	3.71	1.5	141.57	57.29
Hand hoeing.....	1	12.36	5.0	64.87	26.25
Harvesting.....	[a]	281.09	113.75	2,045.23	827.66
Grading and trimming.....	[a]	25.95	10.5	153.60	62.16
Delivery.....	[a]	12.36	5.0	293.32	118.70

[a]Operation performed as required.

Table 9. - Fresh Market Cabbage: Estimated Cost of Production, Ontario, 1986

	Cost, $ per hectare	Cost, $ per acre
VARIABLE COSTS		
Hired labor, 173 hours/ha	856	346
Plants, 21,000/ha	663	268
Fertilizer, N - 169 kg/ha; P_2O_5 - 225 kg/ha; K_2O - 112 kg/ha	280	113
Herbicide	12	5
Insecticides	168	68
Crates, non-returnable, 1,853/ha	2,317	938
Tractor and machine costs:		
Repairs and maintenance	57	23
Fuel	79	32
Interest on operating capital	127	52
TOTAL	26,993	10,923
FIXED COSTS		
Operator labor, 21 hours/ha	146	59
Management allowance, 5% of gross income	302	122
Tractor and machine costs:		
Depreciation	120	49
Interest on investment	62	25
Insurance and storage	32	13
Interest on land, $4,448/ha @ 6.6% per annum	294	119
Taxes	21	8
Other overhead	37	15
TOTAL	1,014	410
TOTAL ALL COSTS[a]	28,007	11,333
COST PER UNIT (Based on average yields of 36.6 tonne/ha and 16.3 ton/acre)[b]	$152.27/tonne	$138.34/ton
GROSS MARGIN ANALYSIS (Based on average prices of $165.30/tonne and $150.00/ton)[c]		
Gross income	6,050	2,445
Total variable costs	4,559	1,845
Gross margin	1,491	600
CASH ANALYSIS		
Gross income	6,050	2,445
Cash costs[d]	4,645	1,879
Returns over cash costs	1,405	566

[a] Storage costs not considered.

[b] Five-year average yields for 1981-85.

[c] Two-year average prices 1983-84.

[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $28/ha ($11/acre) plus taxes and other overhead costs.

Table 10. - Fresh Market Cabbage: Operation Costs, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	.99	.40	30.42	12.31
Discing	1	.49	.20	14.63	5.92
Spreading fertilizer	1	.37	.15	6.82	2.76
Spraying herbicide	1	.37	.15	7.22	2.92
Cultivating & levelling	1	.49	.20	13.91	5.63
Hauling plants & water	[a]	1.23	.50	26.24	10.62
Planting	1	29.60	12.00	300.48	121.60
Spraying insecticides	5	1.85	.75	36.18	14.64
Row cultivating	1	.49	.20	9.44	3.82
Row cultivating and sidedressing	1	.49	.20	10.48	4.24
Hand Hoeing (labor only)	1	17.30	7.00	82.16	33.25
Harvest and pack (labor only)	[a]	136.00	55.00	679.54	275.00
Load and haul to market[b]	[a]	4.94	2.00	133.88	54.18

[a] Operation performed as required.

[b] Hauling to market by use of a truck.

Table 11. - Fresh Market Carrots: Estimated Cost of Production, on Muck Soils, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 47 hours/ha	238	96
Seed, pelleted, 1,700,000/ha	440	178
Fertilizer, N - 72 kg/ha; P_2O_5 - 28 kg/ha; K_2O - 140 kg/ha	123	50
Herbicides	174	70
Insecticides	93	38
Fungicides	164	66
Tractor and machine costs:		
Repairs and maintenance	207	84
Fuel	156	63
Pallet box repairs	31	12
Storage building repairs and maintenance	46	19
Electricity in storage	56	23
Interest on operating capital	92	37
TOTAL	1,820	736
FIXED COSTS		
Operator labor, 42 hours/ha	283	114
Management allowance, 5% of gross income	423	172
Tractor and machine costs:		
Depreciation	539	218
Interest on investment	320	129
Insurance and storage	137	55
Pallet box use	710	288
Storage building, interest & depreciation	418	169
Interest on land, $17,297/ha @ 6.6% per annum	1,142	462
Taxes	52	21
Other overhead	37	15
TOTAL	4,061	1,643
TOTAL ALL COSTS[a]	5,881	2,379
COST PER UNIT (Based on average yields of 67.0 tonne/ha and 29.9 ton/acre)[b]	$196.68/tonne	$35.51/ton
GROSS MARGIN ANALYSIS (Based on average prices of $126.80/tonne and $115.00/ton)[c]		
Gross income	8,497	3,438
Total variable costs	1,820	736
Gross margin	6,677	2,702
CASH ANALYSIS		
Gross income	8,497	3,438
Cash costs[d]	2,051	830
Returns over cash costs	6,446	2,608

[a]Carrots delivered to shipper in bulk bins, no grading and packaging costs are included.

[b]Five-year average yields 1980-84.

[c]Two-year average prices 1983-84.

[d]Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $143/ha ($58/acre) plus taxes and other overhead costs.

Table 12. - Fresh Market Carrots on Muck Soils: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Fall discing	1	.99	.40	29.21	11.82
Spring discing	1	.99	.40	29.21	11.82
Spreading fertilizer	1	.62	.25	12.68	5.13
Spraying herbicide	2	.99	.40	21.13	8.55
Discing and levelling	1	.99	.40	30.44	12.32
Seeding	1	2.47	1.00	70.10	28.37
Spraying (carrot weevil) .	2	.99	.40	21.13	8.55
Spraying (rust fly)	2	.99	.40	21.13	8.55
Spraying herbicide	1	.49	.20	10.55	4.27
Spraying (blight/rust fly)	2	.99	.40	21.13	8.55
Spray control (blight) ...	6	2.96	1.20	63.41	25.66
Hand weeding	1	9.88	4.00	46.95	19.00
Row cultivating and sidedressing	1	2.47	1.00	56.98	23.06
Hand harvesting	1	4.94	2.00	33.36	13.50
Combining	1	12.35	5.00	501.05	202.77
Hauling and unloading at farm storage	1	24.71	10.00	462.93	187.34
Load for market	[a]	9.88	4.00	77.19	31.24
Haul to market	[a]	2.47	1.00	58.66	23.74

[a]Operation performed as required.

Table 13. - Fresh Market Cauliflower: Estimated Cost of Production, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 341 hours/ha	1,682	681
Plants, 21,000/ha	441	178
Fertilizer, N - 162 kg/ha; P_2O_5 - 198 kg/ha; K_2O - 198 kg/ha	255	103
Herbicides	11	5
Insectidices	201	81
Tying bands	76	31
Crates, non-returnable, 1,483	1,927	780
Tractor and machine costs:		
Repairs and maintenance	57	23
Fuel	161	65
Interest on operating capital	138	56
TOTAL	4,949	2,003
FIXED COSTS		
Operator labor, 32.5 hours/ha	219	89
Management allowance, 5% of gross income	369	149
Tractor and machine costs:		
Depreciation	175	71
Interest on investment	86	35
Insurance and storage	54	22
Interest on land, $4,448/ha @ 6.6% per annum	294	119
Taxes	21	8
Other overhead	37	15
TOTAL	1,255	508
TOTAL ALL COSTS[a]	6,204	2,511
COST PER UNIT (Based on average yields of 21.3 tonne/ha and 9.5 ton/ac.)[b]	$291.27/tonne	$264.32/ton
GROSS MARGIN ANALYSIS (Based on average prices of $346.03/tonne and $314.00/ton)[c]		
Gross income	7,370	2,983
Total variable costs	4,949	2,003
Gross margin	2,421	980
CASH ANALYSIS		
Gross income	7,370	2,983
Cash costs[d]	5,045	2,042
Returns over cash costs	2,325	941

[a]Cauliflower is packed into crates at the farm before being hauled to shipper.

[b]Five-year average yields for 1981-85.

[c]Two-year average prices 1983-84.

[d]Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $38/ha ($16/acre) plus taxes and other overhead costs.

Table 14. - Fresh Market Cauliflower: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	.99	.40	30.42	12.31
Discing	1	.49	.20	14.63	5.92
Spreading fertilizer	1	.62	.25	12.68	5.13
Spraying herbicide	1	.37	.15	7.91	3.20
Hauling plants & water	[a]	2.47	1.00	52.53	21.26
Planting	1	29.60	12.00	318.76	129.00
Row cultivating	2	2.47	1.00	51.77	20.95
Hand hoeing (labor only)	1	37.10	15.00	176.06	71.25
Spray insecticides	5	1.85	.75	39.61	16.03
Row cultivating and side-dressing fertilizer	1	.49	.20	11.39	4.61
Tying heads	1	86.50	35.00	410.81	166.25
Harvesting (labor only)	[a]	185.00	75.00	926.64	375.00
Loading and hauling to market[b]	[a]	24.70	10.00	367.44	148.70

[a] Operation performed as required.

[b] Hauling to market by use of a truck.

Table 15. - Fresh Market Celery (Hand Harvest): Estimated Cost of Production on Muck Soils, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 867 hours/ha	4,237	1,715
Seedlings, 40,000/ha	389	157
Fertilizer, N - 229 kg/ha; P_2O_5 - 111 kg/ha; K_2O - 334 kg/ha	578	234
Herbicide	88	36
Insecticides	175	71
Fungicides	139	56
Crates, non-returnable, 2,470	3,212	1,300
Tractor and machine costs:		
Repairs and maintenance	105	43
Fuel	272	110
Greenhouse repairs	32	13
Interest on operating capital	265	107
TOTAL	9,492	3,842
FIXED COSTS		
Operator labor, 79 hours/ha	535	217
Management allowance, 5% of gross income	878	355
Tractor and machine costs:		
Depreciation	256	104
Interest on investment	141	57
Insurance and storage	54	21
Greenhouse, depreciation, interest	151	61
Interest on land, $17,297/ha @ 6.6% per annum	1,142	462
Taxes	39	16
Other overhead	37	15
TOTAL	3,233	1,308
TOTAL ALL COSTS[a]	12,725	5,150
COST PER UNIT (Based on average yields of 83.7 tonne/ha and 37.4 ton/acre)[b]	$152.03/tonne	$137.70/ton
GROSS MARGIN ANALYSIS (Based on average prices of $209.71/tonne and $190.00/ton)[c]		
Gross income	17,553	7,106
Total variable costs	9,492	3,842
Gross margin	8,061	3,264
CASH ANALYSIS		
Gross income	17,553	7,106
Cash costs[d]	9,631	3,900
Returns over cash costs	7,922	3,206

[a] Includes costs of hand harvesting, washing and packing into crates at farm before delivery to shipper.

[b] Five-year average yields 1980-84.

[c] Two-year average prices 1983-84.

[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $63/ha ($26/acre) plus taxes and other overhead costs.

Table 16. - Fresh Market Celery on Muck Soils: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Fall discing	1	2.47	1.00	73.02	29.55
Spreading fertilizer	1	.74	.30	15.22	6.16
Discing and levelling	1	.99	.40	30.44	12.32
Transplant in greenhouse	1	148.26	60.00	704.25	285.00
Greenhouse operations	1	14.83	6.00	100.08	40.50
Hauling plants	1	12.36	5.00	305.30	123.55
Planting in field by hand	1	172.97	70.00	821.62	332.50
Hand weeding	1	54.36	22.00	258.22	104.50
Sidedressing	2	4.94	2.00	95.18	38.52
Irrigating	3	44.48	18.00	567.55	229.68
Spraying weeds	2	1.48	.60	31.70	12.83
Spraying insecticide and fungicide	6	4.45	1.80	95.11	38.49
Cutting in field	[a]	444.79	180.00	2,223.95	900.00
Washing and field packing	[a]	24.70	10.00	123.55	50.00
Loading for market	[a]	12.36	5.00	96.50	39.05
Hauling to market	[a]	2.47	1.00	58.66	23.74

[a]Operation performed as required.

Table 17. - Head Lettuce: Estimated Cost of Production, on Muck Soils, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 549 hours/ha	2,694	1,090
Seed, pelleted, 270,000/ha	117	47
Fertilizer, N - 98 kg/ha; P_2O_5 - 98 kg/ha; K_2O - 98 kg/ha	149	60
Insecticides	279	113
Fungicides	79	32
Tractor and machine costs:		
Repairs and maintenance	130	53
Fuel	231	93
Crates, non-returnable, 835	2,786	1,127
Interest on operating capital	186	75
TOTAL	6,651	2,690
FIXED COSTS		
Operator labor, 36 hours/ha	240	97
Management allowance, 5% of gross income	531	215
Tractor and machine costs:		
Depreciation	301	122
Interest on investment	155	63
Insurance and storage	76	31
Interest on land, $17,297/ha @ 6.6% per annum	1,142	462
Taxes	39	16
Other overhead	37	15
TOTAL	2,521	1,021
TOTAL ALL COSTS[a]	9,172	3,711
COST PER UNIT (Based on average yields of 2,965 doz./ha and 1,200 doz./acre)[b]	$3.09/doz.	$3.09/doz.
GROSS MARGIN ANALYSIS (Based on average prices of $3.58/doz.)[c]		
Gross income	10,615	4,296
Total variable costs	6,651	2,690
Gross margin	3,964	1,606
CASH ANALYSIS		
Gross income	10,615	4,296
Cash costs[d]	6,796	2,749
Returns over cash costs	3,819	1,547

[a] Includes costs of harvesting, packing into crates and delivery to shipper.

[b] Five-year average yields for 1980-84.

[c] Two-year average prices 1983-84.

[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $69/ha ($28/acre) plus taxes and other overhead costs.

Table 18. - Head Lettuce on Muck Soils: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours		Labor, tractor and machine costs, $	
		per ha	per ac.	per ha	per ac.
Fall discing	1	.99	.40	29.53	11.86
Spreading fertilizer	1	.74	.30	15.35	6.18
Discing and levelling	1	.99	.40	30.79	12.36
Seeding	1	2.47	1.00	71.61	28.75
Hand thinning	1	123.55	50.00	586.87	237.50
Irrigating	1	29.65	12.00	263.17	106.29
Spraying insecticides	6	4.45	1.80	95.98	38.63
Spraying fungicides	5	3.71	1.50	79.96	32.18
Hand hoeing	1	98.84	40.00	469.50	190.00
Row cultivating and sidedressing	1	2.47	1.00	57.52	23.14
Harvesting and packing ...	[a]	291.58	118.00	1,457.92	590.00
Spreading crates	[a]	12.35	5.00	336.93	135.15
Hauling to market	[a]	12.35	5.00	340.14	137.00

[a] Operation performed as required.

Table 19. - Peppers for Fresh Market: Estimated Cost of Production, Ontario, 1986

	Cost, $ per hectare	Cost, $ per acre
VARIABLE COSTS		
Hired labor, 180 hours/ha	894	362
Plants, 27,180/ha	557	226
Fertilizer, N - 204 kg/ha; P_2O_5 - 168 kg/ha; K_2O - 168 kg/ha	204	83
Herbicides	15	6
Insecticides	162	65
Fungicides	82	33
Crates, non-returnable, 1,285/ha	1,028	416
Tractor and machine costs:		
Repairs and maintenance	104	42
Fuel	141	57
Interest on operating capital	92	37
TOTAL	3,279	1,327
FIXED COSTS		
Operator labor, 41.5 hours/ha	280	113
Management allowance, 5% of gross income	217	88
Tractor and machine costs:		
Depreciation	197	80
Interest on investment	98	40
Insurance and storage	54	22
Interest on land, $4,448/ha @ 6.6% per annum	294	119
Taxes	21	8
Other overhead	37	15
TOTAL	1,198	485
TOTAL ALL COSTS	4,477	1,812
COST PER UNIT (Based on average yields of 13.7 tonne/ha and 6.1 ton/acre)[a]	$326.79/tonne	$297.05/ton
GROSS MARGIN ANALYSIS (Based on average prices of $317.38/tonne and $288.00/ton)[b]		
Gross income	4,348	1,757
Total variable costs	3,279	1,327
Gross margin	1,069	430
CASH ANALYSIS		
Gross income	4,348	1,757
Cash costs[c]	3,381	1,368
Returns over cash costs	967	389

[a] Five-year average yields for 1981-85.

[c] Two-year average prices 1983-84.

[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $44/ha ($18/acre) plus taxes and other overhead costs.

Table 20. - Peppers for Fresh Market: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	1.48	.60	45.64	18.47
Discing	1	.99	.40	29.21	11.82
Spreading fertilizer	1	.99	.40	18.21	7.37
Spraying herbicide	1	.99	.40	19.30	7.81
Cultivating and levelling	1	.99	.40	27.77	11.24
Hauling plants and water	[a]	2.96	1.20	64.07	25.93
Planting	1	17.80	7.20	180.29	72.96
Row cultivating	2	2.47	1.00	41.41	16.76
Hand hoeing (labor only)	1	17.30	7.00	82.16	33.25
Row cultivating and sidedressing fertilizer	1	1.48	.60	28.00	11.33
Spraying insecticides	7	6.92	2.80	135.14	54.69
Spraying fungicides	2	1.98	.80	38.62	15.63
Harvesting and packing (labor only)	[a]	128.00	52.00	642.47	260.00
Loading in field	[a]	29.60	12.00	266.08	107.68
Hauling to market (using truck)	[a]	7.41	3.00	150.56	60.93

[a] Operation performed as required.

Table 21. - Fresh Market Potatoes: Estimated Cost of Production, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 24 hours/ha	129	52
Seed, potato	494	200
Seed, rye	13	5
Seed treatment	50	21
Fertilizer, N - 168 kg/ha; P_2O_5 - 168 kg/ha; K_2O - 168 kg/ha	229	93
Herbicides	152	62
Insecticides	166	67
Fungicides	103	42
Topkill	43	17
Tractor and machine costs:		
Repairs and maintenance	123	50
Fuel	247	100
Marketing fees	33	13
Interest on operating capital	154	62
TOTAL	1,936	784
FIXED COSTS		
Operator labor, 17 hours/ha	113	46
Management allowance, 5% of gross income	105	43
Tractor and machine costs:		
Depreciation	287	116
Interest on investment	145	59
Insurance and storage	79	32
Interest on land, $3,707/ha @ 6.6% per annum	245	99
Taxes	12	5
Other overhead	37	15
TOTAL	1,023	415
TOTAL ALL COSTS[a]	2,959	1,199
COST PER UNIT	$112.08/tonne	$6.18/cwt.
(Based on average yields of 21.74 tonne/ha and 194 cwt/acre)[b]		
GROSS MARGIN ANALYSIS		
(Based on average prices of $97.00/tonne and $4.40/cwt)[c]		
Gross income	2,109	854
Total variable costs	1,936	784
Gross margin	173	70
CASH ANALYSIS		
Gross income	2,109	854
Cash costs[d]	2,081	843
Returns over cash costs	28	11

[a]Does not include storage and marketing costs.

[b]Based on 1985 average yield.

[c]Price estimated based on previous year's average return.

[d]Cash costs include variable costs, plus interest on debt portion of investment in tractors and machines of $96/ha ($39/acre) plus taxes and other overhead costs.

Table 22. - Fresh Market Potatoes: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours		Labor, tractor and machine costs, $	
		per ha	per ac.	per ha	per ac.
Fall plowing	1	0.82	0.33	29.26	11.84
Discing	2	0.74	0.30	28.19	11.41
Plant rye	1	0.99	0.40	37.46	15.16
Spring plowing	1	0.99	0.40	35.46	14.35
Discing	1	0.37	0.15	14.08	5.70
Field cultivating	1	0.37	0.15	12.97	5.25
Cutting seed	1	0.86	0.35	21.10	8.54
Hauling fertilizer	1	0.62	0.25	31.60	12.79
Hauling seed	1	1.24	0.50	58.89	23.83
Planting	1	4.34	1.75	97.29	39.37
Row cultivating	1	1.36	0.55	32.52	13.16
Hilling	1	0.82	0.33	18.83	7.62
Spraying herbicide	1	0.40	0.16	12.16	4.92
Spraying insecticide and fungicide	6	1.63	0.66	57.53	23.28
Spraying topkill	1	0.27	0.11	9.61	3.89
Digging and windrowing ..	1	2.47	1.00	73.74	29.84
Harvesting	1	7.41	3.00	128.52	52.01
Hauling to storage	1	7.41	3.00	357.76	144.78
Unloading and grading ...	1	7.41	3.00	67.21	27.20

Table 23. - Sweet Corn for Fresh Market (Hand Harvest): Estimated Cost of Production, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 95 hours/ha	477	193
Seed, 13.5 kg/ha	124	50
Fertilizer, N - 126 kg/ha; P_2O_5 - 64 kg/ha; K_2O - 74 kg/ha	130	53
Herbicide	49	20
Insecticide	118	48
Crates, non-returnable, 445/ha	334	135
Tractor and machine costs:		
Repairs and maintenance	62	25
Fuel	87	35
Custom work	12	5
Interest on operating capital	40	16
TOTAL	1,433	580
FIXED COSTS		
Operator labor, 25 hours/ha	90	36
Management allowance, 5% of gross income	121	49
Tractor and machine costs:		
Depreciation	127	52
Interest on investment	64	26
Insurance and storage	29	12
Interest on land, $4,448/ha @ 6.6% per annum	294	119
Taxes	21	8
Other overhead costs	37	15
TOTAL	783	317
TOTAL ALL COSTS[a]	2,216	897
COST PER UNIT (Based on average yields of 2,236 doz./ha and 905 doz./acre)[b]	$.99/doz	$.99/doz
GROSS MARGIN ANALYSIS (Based on average prices of $1.08/doz.)[c]		
Gross income	2,415	977
Total variable costs	1,433	580
Gross margin	982	397
CASH ANALYSIS		
Gross income	2,415	977
Cash costs[d]	1,520	615
Returns over cash costs	895	362

[a]Sweet corn is hand harvested and packed into crates at the farm before being hauled to shipper.

[b]Five-year average yields 1981-85.

[c]Two-year average prices 1983-84.

[d]Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $29/ha ($12/acre) plus taxes and other overhead costs.

Table 24. - Sweet Corn for Fresh Market (Hand Harvest): Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	.79	.32	24.36	9.86
Discing	1	.99	.40	29.21	11.82
Spreading fertilizer	1	.99	.40	18.21	7.37
Spraying herbicide	1	.99	.40	19.30	7.81
Cultivating and harrowing	1	.99	.40	28.02	11.34
Hauling seed and fertilizer	[a]	.30	.12	6.05	2.45
Planting	1	.59	.24	23.20	9.39
Row cultivating	2	1.58	.64	26.49	10.72
Custom applying "N" and herbicide	1	--	—	11.74	4.75
Spray insecticides	4	3.95	1.60	77.22	31.25
Picking and hauling to farm yard	[a]	69.20	28.00	465.67	188.45
Sort and pack (labor only)	[a]	24.70	10.00	123.55	50.00
Haul to market[b]	[a]	2.47	1.00	66.94	27.09
Disc down stalks	1	.99	.40	28.47	11.52

[a]Operation performed as required.

[b]Using a truck.

— not applicable

Table 25. - Field Tomatoes for Fresh Market: Estimated Cost of Production, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 417 hours/ha	2,076	840
Plants, 24,710/ha	618	250
Fertilizer: Plant Starter 6-24-24, 49 litres/ha	14	5
N - 225 kg/ha; P_2O_5 - 93 kg/ha; K_2O - 270 kg/ha	246	100
Herbicide	12	5
Insecticide	32	13
Fungicide	161	65
Containers, non-returnable, 2,031/ha	2,945	1,192
Use of picking baskets	49	20
Tractor and machine costs:		
Repairs and maintenance	155	63
Fuel	264	107
Interest on operating capital	189	76
TOTAL	6,761	2,736
FIXED COSTS		
Operator labor, 39 hours/ha	257	104
Management allowance, 5% of gross income	471	191
Tractor and machine costs:		
Depreciation	332	134
Interest on investment	160	65
Insurance and storage	88	35
Interest on land, $4,448/ha @ 6.6% per annum	294	119
Taxes	21	8
Other overhead	37	15
TOTAL	1,660	671
TOTAL ALL COSTS[a]	8,421	3,407
COST PER UNIT (Based on average yields of 20.8 tonne/ha and 9.3 ton/acre)[b]	$404.86/tonne	$366.34/ton
GROSS MARGIN ANALYSIS (Based on average prices of $451.82/tonne and $410.00/ton)[c]		
Gross income	9,398	3,813
Total variable costs	6,761	2,736
Gross margin	2,637	1,077
CASH ANALYSIS		
Gross income	9,398	3,813
Cash costs[d]	6,891	2,788
Returns over cash costs	2,507	1,025

[a] Tomatoes are graded and packed into containers at farm before being shipped to dealer.

[b] Five-year average yields for 1981-85.

[c] Two-year average prices 1983-84.

[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $72/ha ($29/acre) plus taxes and other overhead costs.

Table 26. - Field Tomatoes for Fresh Market: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	1.48	.60	45.64	18.47
Discing	1	.99	.40	29.21	11.82
Spreading fertilizer	1	.99	.40	18.21	7.37
Spraying herbicide	1	.99	.40	19.30	7.81
Field cultivating and levelling	1	.99	.40	27.77	11.24
Hauling plants & water	[a]	1.98	.80	42.00	17.00
Planting	1	17.80	7.20	180.29	72.96
Row cultivating	1	.90	.40	16.56	6.70
Hand hoeing (labor only)	1	24.70	10.00	117.37	47.50
Row cultivate and sidedress	3	2.96	1.20	55.94	22.64
Spraying for insect and disease control	6	5.93	2.40	115.82	46.87
Harvesting and packing	[a]	380.00	154.00	2,261.88	915.35
Hauling to market[b]	[a]	14.80	6.00	401.64	162.54

[a] Operation performed as required.

[b] Using a truck.

Table 27. - Yellow Seed Onions: Estimated Cost of Production, on Muck Soils, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 86.5 hours/ha	427	173
Seed, pelleted, treated, 1,110,000/ha	745	302
Fertilizer, N - 147 kg/ha; P_2O_5 - 49 kg/ha; K_2O - 247 kg/ha	262	106
Herbicides	656	265
Insecticides	178	72
Fungicides	262	106
Sprout inhibitor	48	19
Plastic covers	25	10
Tractor and machine costs:		
Repairs and maintenance	222	90
Fuel	160	65
Pallet box repairs	22	9
Storage building and repairs	37	15
Electricity, used in storage	37	15
Interest on operating capital	162	66
TOTAL	3,243	1,313
FIXED COSTS		
Operator labor, 36 hours/ha	241	98
Management allowance, 5% of gross income	377	153
Tractor and machine costs:		
Depreciation	620	251
Interest on investment	379	153
Insurance and storage	125	51
Pallet box use	498	202
Storage building, interest and depreciation	426	172
Interest on land, $17,297/ha @ 6.6% per annum	1,142	462
Taxes	52	21
Other overhead	37	15
TOTAL	3,897	1,578
TOTAL ALL COSTS[a]	7,140	2,891
COST PER UNIT (Based on average yields of 41.5 tonne/ha and 18.5 ton/acre)[b]	$172.05/tonne	$156.27/ton
GROSS MARGIN ANALYSIS (Based on average prices of $181.90/tonne and $165.00/ton)[c]		
Gross income	7,549	3,052
Total variable costs	3,243	1,313
Gross margin	4,306	1,739
CASH ANALYSIS		
Gross income	7,549	3,052
Cash costs[d]	3,401	1,377
Returns over cash costs	4,148	1,675

[a] Onions are delivered to shipper in bulk bins, costs of grading and bagging are not included.
[b] Five-year average yields for 1980-84.
[c] Three-year average prices 1983-84.
[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $69/ha ($28/acre) plus taxes and other overhead costs.

Table 28. - Yellow Seed Onions on Muck Soils: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Fall discing	1	.99	.40	29.21	11.82
Spreading fertilizer	1	.62	.25	12.68	5.13
Spraying herbicide	1	.49	.20	10.55	4.27
Discing and levelling, spring	1	.99	.40	30.44	12.32
Seeding (onion magget control)	1	2.47	1.00	70.85	28.67
Spraying herbicide, post emerge	10	4.94	2.00	105.66	42.76
Spraying insecticide	5	2.47	1.00	52.83	21.38
Spraying fungicide	9	4.44	1.80	95.11	38.49
Spraying sprout inhibitor	1	.49	.20	10.55	4.27
Hand weeding	1	42.00	17.00	199.54	80.75
Row cultivating and sidedressing	1	2.47	1.00	56.98	23.06
Pulling and windrowing	1	4.94	2.00	107.29	43.42
Combining	1	17.30	7.00	695.83	281.59
Stacking pallet boxes in field	[a]	4.94	2.00	81.35	32.92
Hauling to storage	[a]	14.83	6.00	289.01	116.96
Unloading at storage	[a]	4.94	2.00	24.70	10.00
Load and haul to market	[a]	9.88	4.00	118.56	47.98

[a]Operation performed as required.

Table 29. - Cabbage for Processing: Estimated Cost of Production, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 37 hours/ha	176	71
Plants, 29,450/ha	498	201
Fertilizer, N - 169 kg/ha; P_2O_5 - 225 kg/ha; K_2O - 112 kg/ha	271	109
Herbicide	14	6
Insecticides	152	62
Tractor and machine costs:		
Repairs and maintenance	75	30
Fuel	108	44
Custom harvest and haul	582	236
Crop insurance	67	27
Marketing fees	25	10
Interest on operating capital	19	8
TOTAL	1,987	804
FIXED COSTS		
Operator labor, 16.4 hours/ha	111	45
Management allowance, 5% of gross income	124	50
Tractor and machine costs:		
Depreciation	113	46
Interest on investment	59	24
Insurance and storage	22	9
Interest on land, $4,448/ha @ 6.6% per annum	294	119
Taxes	20	8
Other overhead	37	15
TOTAL	780	316
TOTAL ALL COSTS	2,767	1,120
COST PER UNIT (Based on average yields of 42.4 tonne/ha and 18.9 ton/acre)[a]	$65.26/tonne	$59.26/ton
GROSS MARGIN ANALYSIS (Based on average prices of $58.62/tonne and $53.19/ton)[b]		
Gross income	2,485	1,005
Total variable costs	1,987	804
Gross margin	498	201
CASH ANALYSIS		
Gross income	2,485	1,005
Cash costs[c]	2,071	838
Returns over cash costs	414	167

[a] Five-year average yields for 1981-85.

[b] 1986 contract price.

[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $27/ha ($11/acre) plus taxes and other overhead costs.

Table 30. - Cabbage for Processing: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	.99	.40	41.27	16.70
Discing	1	.37	.15	18.21	7.37
Spreading fertilizer	1	.37	.15	9.27	3.75
Spraying herbicide	1	.37	.15	10.03	4.06
Field cultivating, harrowing and packing	2	.74	.30	32.64	13.21
Hauling plants & water	[a]	1.24	.50	39.83	16.12
Planting	1	29.70	12.00	365.32	147.84
Spraying insecticides	4	1.48	.60	40.13	16.24
Row cultivating	1	.49	.20	12.68	5.13
Hand hoeing (labor only)	1	17.30	7.00	82.16	33.25
Row cultivating and sidedressing fertilizer	1	.49	.20	13.71	5.55
Custom harvest	1	--	--	296.53	120.00
Custom hauling	1	--	--	285.41	115.50

[a]Operation performed as required.

Table 31. - Cucumbers for Processing: Estimated Cost of Production, Ontario, 1986

	Cost, $ per hectare	Cost, $ per acre
VARIABLE COSTS		
Hired labor, 541 hours/ha	2,701	1,093
Seed, 3.36 kg/ha	89	36
Fertilizer, N - 118 kg/ha; P_2O_5 - 168 kg/ha; K_2O - 168 kg/ha	205	83
Insecticide	40	16
Fungicide	131	53
Tractor and machine costs:		
Repairs and maintenance	53	22
Fuel	90	36
Bee rental	50	20
Use of picking baskets	90	36
Crop insurance	46	19
Marketing and grading fees	48	20
Interest on operating capital	35	14
TOTAL	3,578	1,448
FIXED COSTS		
Operator labor, 5.4 hours/ha	92	37
Management allowance, 5% of gross income	232	94
Tractor and machine costs:		
Depreciation	84	34
Interest on investment	43	17
Insurance and storage	17	7
Interest on land, $4,448/ha @ 6.6% per annum	294	119
Taxes	20	8
Other overhead	37	15
TOTAL	819	331
TOTAL ALL COSTS	4,397	1,779
COST PER UNIT (Based on average yields of 20.4 tonne/ha and 9.1 ton/acre)[a]	$215.54/tonne	$195.49/ton
GROSS MARGIN ANALYSIS (Based on average prices of $227.09/tonne and $206.07/ton)[b]		
Gross income	4,633	1,875
Total variable costs	3,578	1,448
Gross margin	1,055	427
CASH ANALYSIS		
Gross income	4,633	1,875
Cash costs[c]	3,654	1,479
Returns over cash costs	979	396

[a] Five-year average yields for 1981-85.

[b] 1986 price based on 1985 average less 1.4 percent.

[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $19/ha ($8/acre) plus taxes and other overhead costs.

Table 32. - Cucumbers for Processing: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	.99	.40	41.27	16.70
Discing	1	.37	.15	18.21	7.37
Spreading fertilizer	1	.37	.15	9.27	3.75
Cultivating, harrowing and packing	1	.37	.15	16.31	6.60
Planting	1	.99	.40	32.99	13.35
Hand hoeing (labor only)	1	17.30	7.00	82.16	33.25
Row cultivating	1	.49	.20	12.68	5.13
Spraying fungicides	3	1.11	.45	30.10	12.18
Row cultivating and side-dressing fertilizer	2	1.24	.50	34.30	13.88
Spraying insecticide	1	.37	.15	10.03	4.06
Picking (labor only)	[a]	524.00	212.00	2,619.31	1,060.00
Loading in field	[a]	4.94	2.00	115.89	46.90
Hauling to market[b]	[a]	2.47	1.00	57.95	23.45

[a]Operation performed as required.

[b]Hauling with tractor and wagons.

Table 33. - Green Peas for Processing: Estimated Cost of Production, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Seed, 252 kg/ha	227	92
Fertilizer, N - 13 kg/ha; P_2O_5 - 25 kg/ha; K_2O - 38 kg/ha	44	18
Herbicide	38	15
Tractor and machine costs:		
Repairs and maintenance	24	10
Fuel	35	14
Custom harvesting and hauling	301	122
Crop insurance	54	22
Marketing and grading fees	13	5
Interest on operating capital	7	3
TOTAL	743	301
FIXED COSTS		
Operator labor, 4 hours/ha	27	11
Management allowance, 5% of gross income	65	26
Tractor and machine costs:		
Depreciation	37	15
Interest on investment	19	8
Insurance and storage	4	2
Interest on land, $3,336/ha @ 6.6% per annum	220	89
Taxes	14	6
Other overhead	37	15
TOTAL	423	172
TOTAL ALL COSTS	1,166	473
COST PER UNIT (Based on average yields of 3.66 tonne/ha and 1.63 ton/acre)[a]	$318.58/tonne	$290.18/ton
GROSS MARGIN ANALYSIS (Based on average prices of $356.34/tonne and $323.36/ton)[b]		
Gross income	1,304	527
Total variable costs	743	301
Gross margin	561	226
CASH ANALYSIS		
Gross income	1,304	527
Cash costs[c]	802	325
Returns over cash costs	502	202

[a] Five-year average yields 1981-85.

[b] 1986 price based on 1985 average price less 2.1%.

[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $8/ha ($3/acre) plus taxes and other overhead costs.

Table 34. - Green Peas for Processing: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	.99	.40	41.27	16.70
Discing	1	.35	.14	17.00	6.88
Spreading fertilizer	1	.35	.14	8.65	3.50
Spraying herbicides	2	.69	.28	18.73	7.58
Cultivating, harrowing and packing	1	.35	.14	15.25	6.17
Hauling seed	1	.25	.10	7.98	3.23
Planting	1	.99	.40	35.83	14.50
Custom harvesting and hauling	1	—	—	301.47	122.00

— not applicable

Table 35. - Green and Wax Beans for Processing: Estimated Cost of Production, Ontario, 1986

	Cost, $ per hectare	Cost, $ per acre
VARIABLE COSTS		
Seed, 89 kg/ha	290	117
Fertilizer, N - 17 kg/ha; P_2O_5 - 34 kg/ha; K_2O - 50 kg/ha	44	18
Herbicide	18	8
Tractor and machine costs:		
Repairs and maintenance	23	9
Fuel	32	13
Custom harvesting and hauling	310	126
Custom spraying	15	6
Crop insurance	94	38
Marketing and grading fees	20	8
Interest on operating capital	8	3
TOTAL	854	346
FIXED COSTS		
Operator labor, 3.6 hours/ha	24	10
Management allowance, 5% of gross income	72	29
Tractor and machine costs:		
Depreciation	31	12
Interest on investment	17	7
Insurance and storage	6	3
Interest on land, $3,336/ha @ 6.6% per annum	220	89
Taxes	14	6
Other overhead	37	15
TOTAL	421	171
TOTAL ALL COSTS	1,275	517
COST PER UNIT (Based on average yields of 5.99 tonne/ha and 2.67 ton/acre)[a]	$212.85/tonne	$193.73/ton
GROSS MARGIN ANALYSIS (Based on average prices of $240.24/tonne and $218.00/ton)[b]		
Gross income	1,439	582
Total variable costs	854	346
Gross margin	585	236
CASH ANALYSIS		
Gross income	1,439	582
Cash costs[c]	913	370
Returns over cash costs	526	212

[a] Five-year average yields for 1981-85.

[b] 1986 contract price.

[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $8/ha ($3/acre) plus taxes and other overhead costs.

Table 36. - Green and Wax Beans for Processing: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	.99	.40	41.27	16.70
Discing	1	.35	.14	17.00	6.88
Spreading fertilizer	1	.35	.14	8.65	3.50
Spraying herbicide	1	.35	.14	9.37	3.79
Cultivating, harrowing and packing	1	.35	.14	15.25	6.17
Hauling seed	1	.25	.10	7.98	3.23
Planting	1	.49	.20	22.56	9.13
Custom spray herbicide	1	--	--	14.83	6.00
Row cultivating	1	.44	.18	11.44	4.63
Custom harvesting and hauling	1	--	--	310.12	125.50

-- not applicable

Table 37. - Lima Beans for Processing: Estimated Cost of Production, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Seed, 59 kg/ha	94	38
Fertilizer, N - 17 kg/ha; P_2O_5 - 34 kg/ha; K_2O - 50 kg/ha	44	18
Herbicide	57	23
Tractor and machine costs:		
Repairs and maintenance	32	13
Fuel	36	15
Custom harvesting and hauling	250	101
Crop insurance	94	38
Marketing fees	14	6
Interest on operating capital	6	3
TOTAL	627	255
FIXED COSTS		
Operator labor, 4.7 hours/ha	32	13
Management allowance, 5% of gross income	70	28
Tractor and machine costs:		
Depreciation	40	16
Interest on investment	22	9
Insurance and storage	8	3
Interest on land, $4,448/ha @ 6.6% per annum	294	119
Taxes	21	8
Other overhead	37	15
TOTAL	524	211
TOTAL ALL COSTS	1,151	466
COST PER UNIT (Based on average yields of 2.60 tonne/ha and 1.16 ton/acre)[a]	$442.69/tonne	$401.72/ton
GROSS MARGIN ANALYSIS (Based on average prices of $537.22/tonne and $487.50/ton)[b]		
Gross income	1,397	566
Total variable costs	627	255
Gross margin	770	311
CASH ANALYSIS		
Gross income	1,397	566
Cash costs[c]	694	282
Returns over cash costs	703	284

[a] Five-year average yields for 1981-85.

[b] 1986 contract price.

[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $9/ha ($4/acre) plus taxes and other overhead costs.

Table 38. - Lima Beans: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	.99	.40	41.27	16.70
Discing	1	.34	.14	17.00	6.88
Spreading fertilizer	1	.34	.14	8.65	3.50
Spraying herbicide	1	.34	.14	9.36	3.79
Cultivating, harrowing and packing	2	.69	.28	30.47	12.33
Hauling seed	1	.25	.10	7.98	3.23
Planting	1	.49	.20	22.56	9.13
Spraying herbicide	1	.34	.14	9.36	3.79
Rotary hoeing	1	.34	.14	9.22	3.73
Row cultivating	1	.54	.22	13.94	5.64
Custom swathing	1	—	—	21.00	8.50
Custom harvesting and hauling	1	—	—	229.31	92.80

— not applicable

Table 39. - Peppers for Processing: Estimated Cost of Production, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 178 hours/ha	880	356
Plants, 27,180/ha	537	217
Fertilizer, N - 118 kg/ha; P_2O_5 - 168 kg/ha; K_2O - 168 kg/ha	205	83
Herbicide	15	6
Insecticides	162	65
Allowance for use of picking baskets	61	25
Tractor and machine costs:		
Repairs and maintenance	118	48
Fuel	163	66
Crop insurance	131	53
Marketing fees	39	16
Interest on operating capital	44	18
TOTAL	2,355	953
FIXED COSTS		
Operator labor, 27.8 hours/ha	188	76
Management allowance, 5% of gross income	182	74
Tractor and machine costs:		
Depreciation	175	71
Interest on investment	87	35
Insurance and storage	31	12
Interest on land, $4,448/ha @ 6.6% per annum	293	119
Taxes	20	8
Other overhead	37	15
TOTAL	1,013	410
TOTAL ALL COSTS	3,368	1,363
COST PER UNIT (Based on average yields of 14.26 tonne/ha and 6.36 ton/acre)[a]	$236.19/tonne	$214.31/ton
GROSS MARGIN ANALYSIS (Based on average prices of $254.83/tonne and $231.24/ton)[b]		
Gross income	3,634	1,471
Total variable costs	2,355	953
Gross margin	1,279	518
CASH ANALYSIS		
Gross income	3,634	1,471
Cash costs[c]	2,451	992
Returns over cash costs	1,183	479

[a] Five-year average yields for 1981-85.

[b] Price based on 1985 average less a decrease of 7/10 of 1 percent.

[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $39/ha ($16/acre) plus taxes and other overhead costs.

Table 40. - Peppers for Processing: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	.99	.40	41.27	16.70
Discing	1	.37	.15	18.21	7.37
Spreading fertilizer	1	.37	.15	9.27	3.75
Spraying herbicide	1	.37	.15	10.03	4.06
Cultivating, harrowing and packing	2	.74	.30	32.64	13.21
Hauling plants	[a]	1.24	.50	39.83	16.12
Planting	1	29.60	12.00	365.32	147.84
Row cultivating	1	.62	.25	15.84	6.41
Spraying insecticides	7	2.59	1.05	70.20	28.41
Hand hoeing (labor only)	1	17.30	7.00	82.16	33.25
Row cultivating and sidedressing	1	.74	.30	20.63	8.35
Hand picking (labor only)	[a]	133.43	54.00	667.18	270.00
Loading in field	[a]	14.83	6.00	210.90	85.35
Hauling to market[b]	[a]	2.47	1.00	57.95	23.45

[a] Operation performed as required.

[b] Hauling to market by using a tractor and wagons.

Table 41. - Potatoes for Processing: Estimated Cost of Production, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 27.7 hours/ha	148	60
Cover crop seed	33	13
Potato seed	494	200
Seed treatment	51	21
Fertilizer, N - 185 kg/ha; P_2O_5 - 185 kg/ha; K_2O - 185 kg/ha	255	103
Herbicide	108	44
Insecticides	187	76
Fungicides	90	37
Topkill	43	17
Tractor and machine costs:		
Repairs and maintenance	137	55
Fuel	299	121
Custom work	42	17
Marketing fees	38	16
Interest on operating capital	166	67
TOTAL	2,091	847
FIXED COSTS		
Operator labor, 15.4 hours/ha	104	42
Management allowance, 5% of gross income	167	68
Tractor and machine costs:		
Depreciation	333	135
Interest on investment	167	68
Insurance and storage	96	39
Interest on land, $3,707/ha @ 6.6% per annum	245	99
Taxes	12	5
Other overhead	37	15
TOTAL	1,161	471
TOTAL ALL COSTS[a]	3,252	1,318
COST PER UNIT (Based on average yields of 24.1 tonne/ha and 215 cwt./acre)[b]	$134.94/tonne	$6.12/cwt.
GROSS MARGIN ANALYSIS (Based on average prices of $138.88/tonne and $6.30/cwt)[c]		
Gross income	3,347	1,355
Total variable costs	2,091	847
Gross margin	1,256	508
CASH ANALYSIS		
Gross income	3,347	1,355
Cash costs[d]	2,251	912
Returns over cash costs	1,096	443

[a]This does not include storage costs.

[b]Estimated yields for 1985.

[c]Price estimated based on previous year's average return.

[d]Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $111/ha ($45/acre) plus taxes and other overhead costs.

Table 42. - Potatoes for Processing: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Discing	1	1.24	0.50	46.99	19.02
Seeding cover crop	1	0.62	0.25	23.40	9.47
Spring plowing (cover crops)	1	1.24	0.50	44.28	17.92
Spreading lime (custom)	1	—	—	42.01	17.00
Chisel plowing	1	1.24	0.50	39.98	16.18
Discing	1	1.24	0.50	46.99	19.02
Field cultivating	2	0.27	0.33	28.89	11.69
Cutting seed	1	0.86	0.35	21.10	8.54
Hauling fertilizer and seed	1	2.47	1.00	116.81	47.27
Planting	1	1.78	0.72	60.79	24.60
Row cultivating	1	0.69	0.28	16.75	6.78
Hilling	1	1.24	0.50	28.47	11.52
Hauling water for spraying	1	1.24	0.50	60.12	24.33
Spraying herbicide	1	0.49	0.20	15.20	6.15
Spraying insecticide	1	0.32	0.13	11.02	4.46
Spraying fungicide	1	1.73	0.70	60.74	24.58
Spraying topkill:	1	0.32	0.13	11.02	4.46
Digging and windrowing	1	2.47	1.00	90.47	36.61
Harvesting	1	7.41	3.00	126.66	51.26
Hauling to storage	1	7.41	3.00	355.29	143.78
Unload at storage	1	7.41	3.00	79.57	32.20

Table 43. - Red Beets for Processing: Estimated Cost of Production, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 62 hours/ha	293	119
Seed, 7 kg/ha	62	25
Fertilizer, N - 123 kg/ha; P_2O_5 - 142 kg/ha; K_2O - 101 kg/ha	198	80
Herbicide	284	115
Tractor and machine costs:		
Repairs and maintenance	65	26
Fuel	54	22
Custom harvesting and hauling	533	216
Crop insurance	61	24
Marketing fees	25	10
Interest on operating capital	45	18
TOTAL	1,620	655
FIXED COSTS		
Operator labor, 13 hours/ha	88	36
Management allowance, 5% of gross income	129	52
Tractor and machine costs:		
Depreciation	76	31
Interest on investment	39	16
Insurance and storage	13	5
Interest on land, $6,672/ha @ 6.6% per annum	440	178
Taxes	21	8
Other overhead	37	15
TOTAL	843	341
TOTAL ALL COSTS	2,463	996
COST PER UNIT (Based on average yields of 30.76 tonne/ha and 13.72 ton/acre)[a]	$80.07/tonne	$72.59/ton
GROSS MARGIN ANALYSIS (Based on average prices of $84.14/tonne and $76.35/ton)[b]		
Gross income	2,588	1,048
Total variable costs	1,620	655
Gross margin	968	393
CASH ANALYSIS		
Gross income	2,588	1,048
Cash costs[c]	1,696	685
Returns over cash costs	892	363

[a] Five-year average yields for 1981-85.

[b] 1986 price based on 1985 average price less 1/2 of 1 percent.

[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $18/ha ($7/acre) plus taxes and other overhead costs.

Table 44. - Red Beets for Processing: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	.79	.32	33.04	13.37
Discing	1	.40	.16	19.45	7.87
Spreading fertilizer	1	.40	.16	9.88	4.00
Spraying herbicide	2	.79	.32	21.45	8.68
Cultivating and harrowing	1	.40	.16	16.26	6.58
Planting	1	1.98	.80	66.00	26.71
Row cultivating	3	3.56	1.44	91.30	36.95
Hand hoeing (labor only)	1	61.80	25.00	293.44	118.75
Spraying foliar micronutrients	2	.79	.32	21.40	8.66
Custom harvesting	1	—	—	266.63	107.90
Custom hauling	1	—	—	266.63	107.90
Helping harvest (labor only)	[a]	2.47	1.00	16.68	6.75

— not applicable

[a]Operation performed as required.

Table 45. - Sweet Corn for Processing: Estimated Cost of Production, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Seed, 9 kg/ha	43	18
Fertilizer, N -111 kg/ha; P_2O_5 - 68 kg/ha; K_2O - 68 kg/ha	125	50
Herbicide	51	21
Insecticide	14	6
Tractor and machine costs:		
Repairs and maintenance	26	10
Fuel	36	14
Custom spray and apply "N"	27	11
Custom harvest and haul	156	63
Crop insurance	32	13
Marketing fees	9	4
Interest on operating capital	5	2
TOTAL	524	212
FIXED COSTS		
Operator labor, 3.9 hours/ha	26	10
Management allowance, 5% of gross income	33	16
Tractor and machine costs:		
Depreciation	35	14
Interest on investment	20	8
Insurance and storage	8	3
Interest on land, $3,336/ha @ 6.6% per annum	220	89
Taxes	14	6
Other overhead	37	15
TOTAL	393	161
TOTAL ALL COSTS	917	373
COST PER UNIT (Based on average yields of 11.46 tonne/ha and 5.11 ton/acre)[a]	$80.02/tonne	$72.99/ton
GROSS MARGIN ANALYSIS (Based on average prices of $70.80/tonne and $64.25/ton)[b]		
Gross income	811	328
Total variable costs	524	212
Gross margin	287	116
CASH ANALYSIS		
Gross income	811	328
Cash costs[c]	584	237
Returns over cash costs	227	91

[a] Five-year average yields for 1981-85.

[b] 1986 contract price used at 70% domestic and 30% export.

[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $9/ha ($4/acre) plus taxes and other overhead costs.

Table 46. - Sweet Corn for Processing: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	.99	.40	41.27	16.70
Discing	1	.34	.14	17.00	6.88
Spreading fertilizer	1	.34	.14	8.65	3.50
Cultivating, harrowing and packing	1	.34	.14	15.25	6.17
Hauling seed	1	.25	.10	7.98	3.23
Planting	1	.49	.20	22.56	9.13
Spraying herbicide	1	.34	.14	9.37	3.79
Row cultivating	1	.44	.18	11.44	4.63
Custom apply "N" and herbicide	1	--	--	13.59	5.50
Custom spray insecticide	1	--	--	13.59	5.50
Custom harvest and haul	1	--	--	155.95	63.11
Discing stalks	1	.34	.14	17.00	6.88

— not applicable

Table 47. - Tomatoes for Processing, Hand Harvest, Estimated Cost of Production, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 334 hours/ha	1,724	698
Plants, 22,485/ha	445	180
Fertilizer: plant starter, 10 litres/hectare	14	6
N - 113 kg/ha; P_2O_5 - 94 kg/ha; K_2O - 269 kg/ha	188	76
Herbicide	65	26
Insecticides and fungicides (custom applied, materials included)	374	151
Basket use for picking, 247/ha	121	49
Other materials	23	9
Tractor and machine costs:		
Repairs and maintenance	84	34
Fuel	155	63
Custom hauling	361	146
Crop insurance	118	48
Marketing board and grading fees	72	29
Interest on operating capital	54	22
TOTAL	3,798	1,537
FIXED COSTS		
Operator labor, 18 hours/ha	124	50
Management allowance, 5% of gross income	249	101
Tractor and machine costs:		
Depreciation	139	56
Interest on investment	71	29
Insurance and storage	28	11
Land rental charges	432	175
Other overhead	37	15
TOTAL	1,080	437
TOTAL ALL COSTS	4,878	1,974
COST PER UNIT (Based on average yields of 41.0 tonne/ha and 18.3 ton/acre)[a]	$118.98/tonne	$107.87/ton
GROSS MARGIN ANALYSIS (Based on average prices of $121.28/tonne and $110.05/ton)[b]		
Gross income	4,993	2,014
Total variable costs	3,798	1,537
Gross margin	1,195	477
CASH ANALYSIS		
Gross income	4,993	2,014
Cash costs[c]	3,867	1,565
Returns over cash costs	1,126	449

[a] Five-year average yields for 1981-85.

[b] Using option A, agtron reading of 26, average cull tare of 3% and the 1986 price schedule.

[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $32/ha ($13/acre) plus taxes and other overhead costs.

Table 48. - Tomatoes for Processing, Hand Harvest: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	.74	.30	30.96	12.53
Discing	1	.37	.15	15.47	6.26
Spreading fertilizer	1	.37	.15	9.27	3.75
Field cultivating and harrowing	1	.37	.15	15.20	6.15
Spraying herbicide	1	.37	.15	10.03	4.06
Harrowing and packing	1	.37	.15	15.12	6.12
Hauling water and plants	[a]	1.73	.70	47.62	19.27
Planting	1	27.18	11.00	238.31	96.44
Row cultivating	2	.99	.40	21.65	8.76
Row cultivating and sidedressing	1	.62	.25	14.85	6.01
Hand hoeing (labor only)	1	17.30	7.00	82.16	33.25
Apply ethrel	[b]	.25	.10	6.72	2.72
Hand picking (labor only)	[a]	273.55	110.70	1,395.08	564.57
Spreading baskets	[a]	5.93	2.40	67.71	27.40
Loading in field	[a]	22.24	9.00	354.79	143.58
Hauling to processor (custom)	[a]	--	--	361.76	146.40

[a] Operation performed as required.

[b] Applied on 20% of the acreage.

Table 49. - Tomatoes for Processing, Machine Harvest: Estimated Cost of Production, Ontario, 1986

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 73.4 hours/ha	390	158
Plants, 28,540 kg/ha	564	228
Fertilizer: plant starter, 10 litres/ha	14	6
N - 90 kg/ha; P_2O_5 - 94 kg/ha; K_2O - 269 kg/ha	173	70
Herbicide	65	26
Insecticides and fungicides	213	86
Other materials	79	32
Tractor and machine costs:		
Repairs and maintenance	293	119
Fuel	209	84
Crop insurance	125	51
Marketing board and grading fees	72	29
Interest on operating capital	59	24
TOTAL	2,256	913
FIXED COSTS		
Operator labor, 34 hours/ha	131	53
Management allowance, 5% of gross income	241	98
Tractor and machine costs:		
Depreciation	995	403
Interest on investment	388	157
Insurance and storage	98	39
Land rental charges	556	225
Other overhead	37	15
TOTAL	2,446	990
TOTAL ALL COSTS	4,702	1,903
COST PER UNIT (Based on average yields of 41.0 tonne/ha and 18.3 ton/acre)[a]	$114.68/tonne	$103.99/ton
GROSS MARGIN ANALYSIS (Based on average prices of $117.58/tonne and $106.70/ton)[b]		
Gross income	4,821	1,953
Total variable costs	2,256	913
Gross margin	2,565	1,040
CASH ANALYSIS		
Gross income	4,821	1,953
Cash costs[c]	2,466	948
Returns over cash costs	2,355	1,005

[a] Five-year average yields for 1981-85.

[b] Using option B, agtron reading of 28, average cull tare of 4% and the 1986 price schedule.

[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $173/ha ($70/acre) plus taxes and other overhead costs.

Table 50. - Tomatoes for Processing, Machine Harvest: Operation Costs, Ontario, 1986

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Plowing	1	.62	.25	25.80	10.44
Spreading fertilizer	1	.49	.20	11.52	4.66
Shape beds (fall)	1	.62	.25	33.95	13.74
Reshape beds (spring)	1	.62	.25	33.95	13.74
Incorporate herbicide (using shaper)	1	.62	.25	33.95	13.74
Haul water and plants	[a]	.84	.34	17.20	6.96
Planting	1	27.08	10.96	211.08	85.42
Control weeds (using shaper)	2	.99	.40	54.26	21.96
Control weeds and sidedress (using shaper)	2	1.24	.50	67.86	27.46
Hand hoe (labor only)	1	17.30	7.00	82.16	33.25
Spray fungicides	6	2.22	.90	92.37	37.38
Spray insecticides	2	.74	.30	30.79	12.46
Haul water for spraying	[a]	.44	.18	14.55	5.89
Apply ethrel	[b]	.49	.20	21.37	8.65
Harvesting	1	23.23	9.40	1,255.29	508.00
Hauling from harvester	1	8.30	3.36	277.82	112.43
Delivery to processor	[a]	6.92	2.80	246.59	99.79

[a] Operation performed as required.

[b] Applied on 75% of the acreage.

Appendix Table 1. - Average Yields per Acre for Vegetables, Ontario, 1980-85

Crop	Unit	1980	1981	1982	1983	1984	1985[a]
				- '000/acre -			
Asparagus (f & p)	lb	1.5	1.2	1.6	1.1	1.1	1.2
Beans, green & wax (f)	lb	5.1	5.4	5.7	5.6	5.7	5.8
Beans, green & wax (p)	lb	5.5	4.1	4.9	4.9	5.7	5.0
Beans, Lima (p)	lb	2.6	2.2	2.3	2.5	2.7	2.0
Beets, topped	lb	28.4	25.8	27.2	25.5	28.7	27.5
Beets, bunching	lb	10.5	12.5	12.4	10.8	12.9	12.5
Broccoli (f & p)	lb	5.5	9.0	11.6	11.8	9.1	10.7
Brussel Sprouts (f & p)	lb	5.7	5.2	6.3	9.7	10.1	10.5
Cabbage (f & p)	lb	35.6	35.4	37.8	34.0	34.5	35.0
Carrots, bunching	lb	11.4	13.4	12.5	10.1	10.2	n/a
Carrots, topped (f & p)	lb	42.4	55.8	63.4	62.6	65.1	50.0
Cauliflower (f & p)	lb	18.3	16.7	19.3	20.1	21.3	21.0
Celery (f & p)	lb	72.4	73.4	65.3	65.4	70.3	65.0
Corn, sweet (f)	doz	0.8	0.8	0.9	0.8	0.9	1.0
Corn, sweet (p)	lb	9.9	10.3	10.3	9.2	10.6	10.2
Cucumber (f)	lb	15.7	15.9	16.4	17.7	15.7	15.6
Cucumber (p)	lb	17.3	18.1	19.2	18.2	18.3	18.2
Lettuce, head (f)	doz	1.4	1.1	1.2	1.1	1.2	1.3
Onions: dry, sets	lb	22.5	14.2	20.2	16.4	18.6	16.0
Onions: dry, silverskin	lb	8.8	9.2	10.1	10.1	10.1	14.0
Onions: dry, Spanish	lb	20.9	23.9	29.6	25.1	23.1	24.0
Onions: dry, yellowskin	lb	29.9	40.6	39.0	37.1	31.6	42.9
Onions, bunching	lb	15.9	16.5	14.9	13.6	16.2	15.0
Parsnips	lb	19.6	17.4	19.4	17.5	17.6	20.0
Peas, green (p)	lb	3.3	3.3	3.2	2.0	3.4	3.7
Peppers (f & p)	lb	8.7	10.6	11.4	11.1	10.8	10.7
Potatoes	lb	21.0	22.0	21.1	19.8	19.1	20.5
Pumpkin & squash	lb	26.7	26.5	25.9	24.6	27.0	n/a
Radishes	lb	8.8	5.6	5.7	9.1	9.3	9.2
Rutabagas	lb	38.5	40.7	43.7	24.8	36.0	n/a
Spinach (f & p)	lb	6.6	5.4	5.4	5.6	8.0	8.0
Tomatoes (f)	lb	15.7	17.0	19.9	20.1	20.2	16.5
Tomatoes (p)	lb	34.5	36.8	37.9	29.6	39.3	40.2

Note: (f) fresh; (f & p) fresh & processing; (p) processing;
n/a not available

[a]Preliminary subject to revision.

Source: Seasonal Fruit and Vegetable Report, Annual Summary, Economics and Policy Coordination Branch, Ontario Ministry of Agriculture and Food

Appendix Table 2. - Average Prices (Imperial Units) per Acre for Vegetables, Ontario, 1979-84

Crop	Unit	1979	1980	1981	1982	1983	1984
				- cents -			
Asparagus (f & p)	lb	69.0	81.9	91.9	107.1	102.8	101.0
Beans, green & wax (f)	lb	24.0	23.1	25.9	26.3	27.0	28.0
Beans, green & wax (p)	lb	9.0	9.2	10.5	11.2	11.0	11.6
Beans, Lima (p)	lb	18.6	20.0	25.6	23.6	23.0	24.3
Beets, topped	lb	3.2	3.4	4.3	4.6	5.0	5.4
Beets, bunching	lb	23.0	27.4	26.7	25.3	43.4	41.0
Broccoli (f & p)	lb	15.6	27.5	32.5	28.6	34.2	34.6
Brussel Sprouts (f & p)	lb	33.8	35.2	39.6	42.9	48.2	44.3
Cabbage (f & p)	lb	4.9	7.0	6.2	5.4	9.8	5.5
Carrots, bunching	lb	3.2	6.1	5.1	3.4	8.1	3.1
Carrots, topped (f & p)	lb	13.5	13.5	18.0	18.4	16.7	16.3
Cauliflower (f & p)	lb	11.8	13.9	14.2	13.9	17.8	15.3
Celery (f & p)	lb	5.9	7.6	9.1	8.5	13.6	8.2
Corn, sweet (f)	doz	74.0	90.4	106.7	100.3	120.4	105.0
Corn, sweet (p)	lb	2.7	2.9	3.5	3.7	3.8	3.6
Cucumber (f)	lb	10.6	10.8	11.4	12.3	12.8	11.0
Cucumber (p)	lb	9.0	8.1	8.4	10.2	9.6	10.5
Cucumber, greenhouse	doz	334.0	362.0	416.0	384.0	506.0	630.9
Lettuce, head (f)	doz	180.0	246.0	329.0	271.5	347.7	331.0
Onions: dry, sets	lb	8.7	8.0	15.9	6.3	11.8	10.9
Onions: dry, silverskin	lb	31.4	30.6	41.3	40.0	40.3	41.0
Onions: dry, Spanish	lb	8.7	13.2	18.4	14.3	14.8	15.2
Onions: dry, yellowskin	lb	4.8	10.2	7.8	4.4	11.0	4.4
Onions, bunching	lb	32.9	37.7	37.0	29.8	34.1	34.8
Parsnips	lb	11.1	15.3	19.3	14.0	16.0	16.0
Peas, green (p)	lb	12.0	13.3	14.9	15.8	15.0	16.1
Peppers (f & p)	lb	12.2	15.0	13.8	13.6	14.7	15.1
Potatoes	lb	3.2	7.9	6.2	4.4	7.8	6.8
Pumpkin & squash	lb	1.4	1.5	1.6	1.7	2.0	1.7
Radishes	lb	20.5	21.8	22.4	21.6	26.3	33.7
Rutabagas	lb	3.8	5.8	4.9	4.2	7.1	3.9
Spinach (f & p)	lb	19.9	20.0	25.3	23.5	29.8	29.0
Tomatoes (f)	lb	15.6	16.3	18.2	17.6	20.1	20.2
Tomatoes (greenhouse)	lb	45.4	45.2	46.5	52.7	60.8	80.1
Tomatoes (p)	lb	4.3	4.5	5.0	5.3	5.1	5.6

Note: (f) fresh; (f & p) fresh & processing; (p) processing;
n/a not available

Source: Seasonal Fruit and Vegetable Report, Annual Summary, Economics and Policy Coordination Branch, Ontario Ministry of Agriculture and Food

Appendix Table 3. - Average Yields per Hectare for Vegetables, Ontario, 1980-85

Crop	1980	1981	1982	1983	1984	1985[a]
			- tonnes/hectare -			
Asparagus (f & p).....	1.7	1.4	1.8	1.2	1.2	1.3
Beans, green & wax (f).....	5.8	6.1	6.4	6.3	6.4	6.5
Beans, green & wax (p).....	6.1	4.6	5.5	5.5	6.4	5.6
Beans, Lima (p).....	2.9	2.4	2.5	2.8	3.0	2.2
Beets, topped.....	32.0	28.9	30.5	28.6	32.2	30.8
Beets, bunching.....	11.7	14.0	13.9	11.9	14.5	14.0
Broccoli (f & p).....	6.2	10.1	13.0	13.2	10.2	12.0
Brussel Sprouts (f & p).....	6.5	5.8	7.1	10.9	11.3	11.8
Cabbage (f & p).....	39.9	39.7	42.4	38.1	38.7	39.2
Carrots, bunching.....	12.6	15.0	14.0	11.3	11.4	n/a
Carrots, topped (f & p).....	38.7	62.5	71.1	70.2	73.0	56.1
Cauliflower (f & p).....	20.5	18.7	21.6	22.5	23.9	23.5
Celery (f & p).....	81.1	82.2	73.2	73.3	78.8	72.9
Corn, sweet (f).....	5.5	5.6	6.1	5.5	6.1	6.7
Corn, sweet (p).....	11.1	11.5	11.6	10.3	11.9	11.4
Cucumber (f).....	17.6	17.8	18.4	19.8	17.6	17.5
Cucumber (p).....	19.4	20.3	21.5	20.4	20.5	20.4
Lettuce, head (f).....	23.6	18.0	19.9	16.5	20.2	21.9
Onions: dry, sets.....	25.2	15.9	22.6	18.4	20.9	17.9
Onions: dry, silverskin.....	9.9	10.4	11.3	11.3	11.3	15.7
Onions: dry, Spanish.....	23.9	26.8	33.2	28.1	25.9	26.9
Onions: dry, yellowskin.....	33.5	45.5	43.7	41.6	35.4	48.1
Onions, bunching.....	17.8	18.5	16.7	17.9	18.2	16.8
Parsnips.....	21.8	17.4	21.7	19.6	19.7	22.4
Peas, green (p).....	3.7	3.7	3.5	2.2	3.8	4.1
Peppers (f & p).....	9.7	11.9	12.8	12.4	12.1	12.0
Potatoes.....	23.5	24.7	23.7	22.2	21.4	23.0
Pumpkin & squash.....	30.0	29.7	29.0	27.6	30.3	n/a
Radishes.....	9.9	6.3	6.4	10.2	10.4	10.3
Rutabagas.....	43.1	45.6	49.0	27.8	31.2	n/a
Spinach (f & p).....	7.4	6.1	6.1	6.3	9.0	9.0
Tomatoes (f).....	17.4	19.1	22.3	22.5	22.6	18.5
Tomatoes (p).....	38.7	41.2	42.6	33.2	44.1	45.1

Note: (f) fresh; (f & p) fresh & processing; (p) processing;
n/a not available

[a]Preliminary subject to revision.

Source: Seasonal Fruit and Vegetable Report, Annual Summary, Economics and Policy Coordination Branch, Ontario Ministry of Agriculture and Food

Appendix Table 4. - Average Prices (Metric Units) per Acre for Vegetables, Ontario, 1979-84

Crop	1979	1980	1981	1982	1983	1984
			- cents/kilogram -			
Asparagus (f & p).....	152.1	180.6	202.5	236.1	226.7	222.7
Beans, green & wax (f).....	52.9	50.9	57.0	57.9	59.4	61.7
Beans, green & wax (p).....	19.8	20.3	23.2	24.6	24.3	25.6
Beans, Lima (p).....	41.0	44.1	56.5	52.0	50.7	53.6
Beets, topped.....	7.1	7.5	9.5	10.2	11.0	11.9
Beets, bunching.....	50.7	60.4	58.8	55.8	95.6	90.4
Broccoli (f & p).....	34.4	60.6	71.6	73.1	75.4	76.3
Brussel Sprouts (f & p).....	74.5	77.6	87.4	94.5	106.4	97.7
Cabbage (f & p).....	10.8	15.4	13.6	12.0	21.7	12.1
Carrots, topped (f & p).....	7.1	13.4	11.2	7.4	18.0	6.8
Carrots, bunching.....	29.8	29.8	39.5	40.6	36.8	35.9
Cauliflower (f & p).....	26.0	30.6	31.2	30.6	39.3	33.7
Celery (f & p).....	13.0	16.8	20.1	18.8	30.0	18.1
Corn, sweet (f).....	27.2	33.2	39.2	36.8	44.6	38.6
Corn, sweet (p).....	6.0	6.4	7.7	8.2	8.4	7.9
Cucumber (f).....	23.4	23.8	25.2	27.1	28.1	24.3
Cucumber (p).....	19.8	17.9	19.8	22.5	21.2	23.2
Cucumber, greenhouse.....	92.1	99.8	114.6	105.9	139.4	173.9
Lettuce, head.....	26.5	36.2	48.4	39.9	51.1	48.7
Onions: dry sets.....	19.1	17.7	35.1	14.0	25.9	24.0
Onions: dry, silverskin.....	69.3	67.4	91.1	88.3	88.7	90.4
Onions: dry, Spanish.....	19.2	29.0	40.6	31.5	32.6	33.5
Onions: dry, yellowskin.....	10.6	22.4	17.2	9.8	24.2	9.7
Onions, bunching.....	72.5	83.1	81.6	65.8	75.3	76.7
Parsnips.....	24.5	33.7	42.5	31.0	35.3	35.3
Peas, green (p).....	26.5	29.3	32.8	34.8	33.1	33.3
Peppers (f & p).....	26.9	33.1	30.4	30.0	32.4	33.3
Potatoes.....	7.1	17.4	13.6	9.8	17.2	15.0
Pumpkin & squash.....	3.1	3.3	3.5	3.7	4.4	3.8
Radishes.....	45.2	48.1	49.4	47.6	58.0	74.3
Rutabagas.....	8.4	12.8	10.8	9.2	15.7	8.6
Spinach (f & p).....	43.9	44.1	55.8	51.7	65.8	63.9
Tomatoes (f).....	34.4	35.9	40.1	38.8	45.3	44.5
Tomatoes (greenhouse).....	100.1	99.6	102.5	116.3	134.0	176.6
Tomatoes (p).....	9.5	9.9	11.0	11.8	11.2	12.4

Note: (f) fresh; (f & p) fresh & processing; (p) processing;
n/a not available

Source: Seasonal Fruit and Vegetable Report, Annual Summary, Economics and Policy Coordination Branch, Ontario Ministry of Agriculture and Food